

**REVIEW OF TEXACO'S SOIL ASSESSMENT REPORT
TUTU WELLFIELD SITE
REMEDIAL DESIGN/REMEDIAL ACTION OVERSIGHT
ST. THOMAS, U.S. VIRGIN ISLAND
Work Assignment No.: 010-ROBE-021D**

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TECHNICAL REVIEW COMMENTS

Texaco Tutu Service Station

St. Thomas, USVI

October 17, 2000

1.0 OVERVIEW

1.1 SCOPE OF WORK

The comments below were submitted by CDM Federal Programs Corporation (CDM Federal) based upon the technical review of Texaco's *Soil Assessment Hydraulic Lift/Abandoned Oil Water Separator Area* report (Soil Assessment Report), prepared by IT Corporation (IT), dated September 2000. The report contains the results for the soil investigation work completed by Texaco in the west hydraulic lift station/oil water separator area at the Texaco Tutu Service Station. The comments also considered information contained in the following related documents:

- *Preliminary Environmental Site Assessment Report: Hydraulic Lift and Abandoned Oil/Water Separator Area.* Submitted by S. Syedali, Virgin Islands Department of Planning and Natural Resources (DPNR), Project Manager, to C. Kwan, U.S. Environmental Protection Agency (EPA), Region II, Remedial Project Manager on June 23, 2000. Prepared by Trinity Environmental, LLC for DPNR, dated June 16, 2000.
- *Notification of Soil Assessment: Hydraulic Lift/Abandoned Oil Water Separator Area.* Letter submitted by S. Syedali, DPNR, Project Manager to N. Campbell, IT Corporation, Client Program Manager, dated May 4, 2000.
- *Notification of Soil Assessment: Hydraulic Lift/Abandoned Oil Water Separator Area.* Letter submitted by N. Campbell, IT Corporation, Client Program Manager on behalf of Texaco to S. Syedali, DPNR, Project Manager, dated April 27, 2000.
- *Notification of Soil Assessment: Hydraulic Lift/Abandoned Oil Water Separator Area* Notification letter and revised work plan (dated March 6, 2000) submitted by N. Campbell, IT Corporation, Client Program Manager on behalf of Texaco to S. Syedali, DPNR, Project Manager, dated April 7, 2000.
- *Revised Work Plan - Soil Assessment & Remediation: Hydraulic Lift/Abandoned Oil Water Separator Area.* Submitted by J. Baldwin, Texaco, to C. Kwan, EPA, Region II, Remedial Project Manager, dated March 6, 2000.
- *Soil Screening Guidance: Technical Background Document.* Prepared by the EPA, Office of Emergency and Remedial Response, Publication No. 9355.4-17A, dated May 1996.

1.2 SUMMARY OF FIELD ACTIVITIES

Texaco completed supplemental soil assessment field work in the hydraulic lift/abandoned oil water separator area at the Texaco Tutu Service Station during the periods of April 13 to 19 and May 8 to 10, 2000. The work was completed for Texaco by IT (environmental contractor) and Caribbean Hydrotech, Inc. (drilling subcontractor). Independent field oversight and limited split sampling were performed by DPNR representatives. CDM Federal was not onsite during these activities, but maintained technical oversight of the field work and associated field decisions/changes via teleconference with Texaco.

2.0 COMMENTS

1. Field Work Completed, General - Based upon a comparison of Texaco's Soil Assessment Report (IT, September 2000) and Revise Work Plan (IT, March 2000) and DPNR's corresponding report (Trinity, June 2000), the supplemental field investigation program was executed in accordance with the work plan requirements and intent. In addition, *ad-hoc* (i.e., non-scope work) groundwater samples were collected by Texaco from three bore holes/temporary well points at the request of DPNR. It is further noted that a number of field changes were made to the original locations of borings SB-1, SB-4, and SB-5 during the course of work to address conditions (e.g., Easter holiday de-mobilization at SB-1, poor sample recovery at SB-5, dark grey-black fluid observed in the soils at SB-4) encountered in the field during the course of work. These boring locations were field adjusted, re-drilled, and sampled to address such conditions. It is CDM Federal's understanding that all field decisions/changes made during the course of work were mutually agreed upon by Texaco and DPNR representatives. CDM Federal was generally kept informed of field progress and consulted regarding field changes by J. Baldwin of Texaco via teleconference.
2. Texaco's Report Content, General - Texaco's Soils Assessment Report (IT, September 2000) focused upon the analytical results for target contaminants subject to cleanup under EPA's July 1996 Record of Decision (ROD), mainly benzene, ethylbenzene, toluene, and xylenes (BTEX), as well as the results for select parameters [e.g. total petroleum hydrocarbons (TPH)] that are not subject to ROD cleanup but have been the subject of recent discussions between Texaco, EPA, and DPNR. The complete results for volatile organic compound (VOC), semi-volatile organic compound (SVOC) and TPH analyses were also included in Appendix G. A comparison of Texaco and DPNR sample results for BTEX, TPH, and naphthalene (i.e., a component of TPH, associated with diesel fuel) are summarized in Table 1 (attached).

Overall, Texaco's sample results support that the soils in the lift station/abandoned oil water separator area conform with the ROD requirements for soil cleanup. In addition, the groundwater sample results were consistent with the existing data obtained by Texaco as part of the on-going groundwater monitoring program. The following items are specifically noted:

- Ethylbenzene and xylenes were detected in a few soil samples [see Table 1 for SB-4 (3.5-5.5', 5.5-7.5') and SB-5A (6-8', 8-10')] above the non-adjusted ROD cleanup goals [290 ppb (0 to 8.7' bgs), 29 ppb (8.7 to 15' bgs)], which were derived using EPA's soil screening guidance methodology for benzene migration to groundwater. Pursuant to the results of the July 1998 Unilateral Administrative Order (UAO) conferences, adjustment of the ROD cleanup goals has been allowed by EPA, subject to review/approval, to account for site-specific [i.e., organic carbon content (f_{oc})] and contaminant-specific [i.e., soil/water partition coefficient (K_d)] properties. The detected ethylbenzene and xylenes concentrations would not exceed the adjusted ROD cleanup goals, which would be approximately 13,000 ppb and 200,000 ppb [EPA, May 1996; see Table A-1 of Appendix A (default soil screening levels)]. Texaco should calculate and the adjusted soil cleanup goals for BTEX and submit them to EPA along with the backup calculations/documentation.
 - TPH [diesel range (DRO)] was detected in a significant number of soil samples at concentrations up to 280 ppm. Such concentrations do not exceed the TPH [DRO + oil range (ORO)] cleanup goal of 5,000 ppm, which was proposed by Esso and generally accepted by DPNR during the August 17, 2000 EPA/DPNR/Esso teleconference for potential future application at the Esso Service Station property.
 - To be conservative, the analytical results for other non-target compounds detected in soil were compared against EPA's default soil screening levels (EPA, May 1996; see Table A-1 of Appendix A) and found to be below these values. It is further noted that these compounds were: 1) generally detected at the Texaco property during multiple remedial investigations completed by Geraghty & Miller, GCL, and others from 1992 to 1994 and 2) eliminated from further consideration regarding cleanup based upon the results of a feasibility study completed by Geraghty & Miller.
3. Comparison of Texaco and DPNR Sample Results, General - DPNR's corresponding report (Trinity, June 2000) addressed BTEX, as well as an expanded list of VOCs and SVOCs that are not subject to ROD cleanup. The DPNR/Texaco split sample results were generally comparable, excluding some of the results for TPH-DRO [see Table 1, SB-4 (3.5-5.5', 5.5-7.5') and SB-5A (6-8')].

Overall, the analytical results contained in DPNR's report support that the soils in the lift station/abandoned oil water separator area conform with the ROD requirements for soil cleanup. In addition, the groundwater sample results were consistent with the existing data obtained by Texaco as part of the on-going groundwater monitoring program. The following items are specifically noted:

- Some of the TPH-DRO soil split sample results varied up to two orders of magnitude in value. For example, the DPNR split samples collected from 3.5 to 5.5 feet bgs and 5.5 to 7.5 feet bgs at SB-4 and from 6 to 8 at SB-5A were

two orders of magnitude higher than the values reported by Texaco, and they exceeded 5,000 ppm. Refer to General Comment #2, Bullet #2, above regarding TPH cleanup.

- DPNR also analyzed a limited number of soil samples for TPH (oil range), as shown on Table 1. These samples were not split by Texaco.
 - A visible sheen (non-measurable thickness) was observed by DPNR during collection of a groundwater sample from SB-3. It is noted that this sample was collected from an open borehole, rather than from one of the existing onsite monitoring wells. Thus, the results may not be representative of site groundwater and should be considered for qualitative use only.
4. Missing Documentation, General - Based upon DPNR's report (DPNR, 2000), a split sample was collected by Texaco and DPNR from the 4-6 foot depth interval at SB-5A. Analytical results for this sample were not reported by Texaco or included in Appendix G of the Texaco report. This information should be submitted by Texaco. In addition, copies of the field logbook notes should be submitted.

3.0 CONCLUSIONS AND RECOMMENDATIONS

In summary, the analytical results obtained from the soil investigation completed by Texaco in the hydraulic lift/abandoned oil water separator area support that: 1) the soils in this area do not exceed the ROD soil cleanup goals and 2) the groundwater has not been significantly impacted by heavy range (diesel, oil) hydrocarbons.

Minor, localized impacts to soils proximal to the hydraulic lift and abandoned oil water separator by heavy range petroleum hydrocarbons were known to exist in advance of this investigation, based upon the results of the prior remedial investigation completed in this area by GCL in 1994. The results of this investigation supplemented and confirmed the findings of the GCL investigation, as well as the on-going groundwater monitoring program, by: 1) completing additional exploratory borings and sampling of the overburden soils to fill in spatial data gaps and 2) advancing borings through fractured bedrock and below the groundwater table to confirm the absence of non-aqueous phase liquid at measurable thickness. *Ad-hoc* groundwater split samples were also collected by Texaco and DPNR from the boreholes/temporary well points. The results obtained from these samples were generally consistent with existing monthly/quarterly data obtained from permanent onsite/offsite monitoring wells as part of the on-going groundwater monitoring program.

Pending resolution of the above comments and the results of followup discussions between EPA, DPNR, and Texaco, CDM Federal concurs with the findings and conclusions of Texaco's report, which support that: 1) the hydrocarbon concentrations in the hydraulic lift/abandoned oil water separator area are generally low and 2) modifications to the existing soil and groundwater treatment systems are not warranted.

TABLE 1
DATA SUMMARY TABLE
SOIL ASSESSMENT FOR THE HYDRAULIC LIFT/ABANDONED OIL WATER SEPARATOR AREA
Texaco Tulu Service Station, St. Thomas, USVI

SAMPLE DESIGNATION (#)	DATE (m/d/yr)	DEPTH (ft bgs)	PID INTERVAL READING (ppmv)	SOIL SAMPLE RESULTS															
				Benzene (ppb)		Toluene (ppb)		Ethylbenzene (ppb)		Xylenes (ppb)		TPH-DRO (ppm) ¹		Napthalene (ppb) ²		TPH-ORO (ppm) ^{3,4}			
				IT	DPNR	IT	DPNR	IT	DPNR	IT	DPNR	IT	DPNR	IT	DPNR	IT	DPNR		
SB-1	4/18/00	0-2	<0.2	BDL		BDL		BDL		BDL		14		BDL					
SB-1	4/18/00	2-4	<0.2	BDL		BDL		BDL		BDL		12		BDL					
SB-1	4/18/00	4-6	<0.2	BDL		BDL		BDL		BDL		7		BDL					
SB-1	4/18/00	7-9	<0.2	BDL		BDL		BDL		BDL		9		BDL					
SB-1	4/18/00	9-11	<0.2	BDL		BDL		BDL		BDL		9		BDL					
SB-1	4/18/00	11-13	<0.2	BDL		BDL		BDL		BDL		12		BDL					
SB-2	4/19/00	3.5-5	<0.2	BDL		BDL		BDL		BDL		23		BDL					
SB-2	4/19/00	5.5-7.5	<0.2	BDL		BDL		BDL		BDL		4		BDL					
SB-2	4/19/00	7.5-9	<0.2	BDL		BDL		BDL		BDL		7		BDL					
SB-2	4/19/00	9-11	<0.2	BDL		BDL		BDL		BDL		7		BDL					
SB-2	4/19/00	11-13	0.3	BDL		BDL		290		BDL		31		BDL					
SB-3	4/18/00	4-6	<0.2	BDL		BDL		BDL		BDL		9		BDL					
SB-3 ¹	4/18/00	6-8	<0.2	BDL		BDL		BDL		BDL		8		BDL					
SB-3 ¹	4/18/00	8-10	<0.2	BDL		BDL		BDL		BDL		31		BDL					
SB-3	4/18/00	10-12	<0.2	BDL		BDL		BDL		BDL		18		BDL					
SB-3	4/18/00	12-14	<0.2	BDL		BDL		BDL		BDL		21		BDL					
SB-3 ¹	4/18/00	14-16	270	BDL		BDL		BDL		BDL		27		BDL					
SB-3 ¹	4/18/00	16-18	822	BDL		BDL		BDL		BDL		81		BDL					
SB-3	4/18/00	18-20	26.7	BDL		BDL		BDL		BDL		8		BDL					
SB-3	4/18/00	20-22	17.5	BDL		BDL		BDL		BDL		25		BDL					
SB-3 ²	4/18/00	22-24	20.2	BDL		BDL		BDL		BDL		18		BDL					
SB-3 ²	4/18/00	24-26	123	BDL		BDL		BDL		BDL		18		BDL					
SB-4	4/19/00	3.5-5.5	3.1	BDL		BDL		88		480		270		4,500					
SB-4	4/19/00	5.5-7.5	55.3	BDL		BDL		1,300		2,600		280		17,000					
SB-4A	5/8/00	2-4	0.5	BDL		BDL		10		46		BDL		BDL					
SB-4A	5/8/00	4-6	10.3	BDL		BDL		BDL		BDL		4		BDL					
SB-4A	5/8/00	6-8	19	BDL		BDL		BDL		10		18		BDL					
SB-4A	5/8/00	8-10	24	BDL		BDL		BDL		13		18		BDL					
SB-4A	5/8/00	10-12	6.9	BDL		BDL		BDL		BDL		BDL		BDL					
SB-4A	5/8/00	12-14	20	BDL		BDL		BDL		BDL		9		BDL					
SB-4A ²	5/8/00	14-16	5.8	BDL		BDL		BDL		BDL		BDL		BDL					
SB-4A ²	5/8/00	16-18	1.3	BDL		BDL		BDL		BDL		7		BDL					
SB-4A ²	5/8/00	18-20	<0.2	BDL		BDL		BDL		BDL		10		BDL					
SB-5A	4/13/00	4-6	57.3	NR		NR		NR		NR		NR		NR					
SB-5A	4/13/00	6-8	106	BDL		BDL		640		BDL		140		1,600					
SB-5A	4/13/00	8-10	437	BDL		BDL		1,000		BDL		150		2,100					
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TABLE 1
DATA SUMMARY TABLE
SOIL ASSESSMENT FOR THE HYDRAULIC LIFT/ABANDONNED OIL WATER SEPARATOR AREA
Texasco Tutu Service Station, St. Thomas, USVI

SAMPLE DESIGNATION (U)	DATE (m/d/yr)	GROUNDWATER SAMPLE RESULTS ⁴											
		Benzene (ppb)		Toluene (ppb)		Ethylbenzene (ppb)		Xylenes (ppb)		TPH-DRO (ppm) ⁵		Naphthalene (ppb) ⁵	
		IT	DPNR	IT	DPNR	IT	DPNR	IT	DPNR	IT	DPNR	IT	DPNR
SB-3 ¹	4/18/00	72	50	BDL	43	79	70	170	26	1,500	3,900	14	14
SB-4A ³	5/9/00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SB-5 ⁴	4/19/00	12	8	2	BDL	2	BDL	BDL	BDL	940	3,800	2	BDL

Notes:

1. Depth interval reported by DPNR for this sample was slightly different than that reported by IT.
2. Samples collected from below the groundwater table.
3. Sampled collected from the benchole.
4. Sampled collected from a temporary well.
5. Cleanup criteria not included in the 1996 ROD for these parameters.
6. Analysis not required by the EPA-approved scope of work for this investigation.
7. NR - Sample collected but results not reported.

